CONFIDENTIAL 1 November 1961

MEMORANDUM FOR: Director of Logistics

SUBJECT : Model I Incinerator at Quarters Eye

1. The purpose of this memorandum is to express TSD feelings regarding appropriate solutions to the problem of excessive dust emission from the Model I incinerator located at Quarters Eye.

2. The Model I incinerator is an air-colled incinerator with the inherent characteristics that nearly all of the clay-type ash contained in the paper, plus a small amount of the charred paper particles, flows out of the combustion chamber with the flue gases. It is primarily designed to facilitate rapid destruction of files in emergency conditions. In view of the mode of operation of the unit at this site, excessively high burning rates have been achieved. The difficulty that arises stems from the greatly aggravated emissions of ash and char that have occurred during operation at these extremely high burning rates. This has been discussed with combustion experts, [redacted] who feel that the nuisance can be satisfactorily resolved. This would be accomplished by collecting almost all of this dusty material in commercially available equipment, and by discharging the remainder at an elevation such that the extremely fine particles would be dispersed innocuously. 25X1 25X1

3. Two basic solutions have been considered which can be expected to reduce the amount of dust emitted to the order of roughly one-sixth to one-twelfth the amount presently emitted. These solutions involve:

(a) A stainless steel commercially built cyclone separator with appropriate stainless steel piping.

(b) A stainless steel, commercially built water scrubber preceded by an appropriate stainless steel, water-spray quenching section and appropriate piping.

These are discussed below, along with the subjects of appropriate stack and probable costs.

Cyclone Separator

A stainless steel cyclone considered applicable to this problem would have to handle hot gases at the rate of about 11,000 lb/hr at 1800°F, maximum. The pressure drop under the above conditions should be approximately three inches of water.

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Such a cyclone would not need an additional gas-handling blower because the present blower on the incinerator has reserve sufficient to overcome the additional resistance. It is recommended that the fine dust accumulated in the cyclone-separator hopper be flushed with water into a sump or sewer, to avoid a dust nuisance when the hopper is unloaded.

Scrubber

If a scrubber is used, we feel that it should be made of stainless steel, to minimize difficulties stemming from corrosion. In such an application, the scrubber should be preceded by a stainless steel duct including water sprays arranged suitably and supplied with sufficient water, thoroughly atomized, so as to reduce the temperature of the gases (11,000 lb/hr) from 1600F to 400F before they enter the scrubber.

In connection with the scrubber, an induced-draft blower would have to be used to overcome the resistance of the scrubber. However, during loading of the incinerator, this blower would cause too much air to be sucked into the incinerator through the open door. Hence, some type of interlocking control should be provided that would connect the charging door with a damper on the scrubber discharge, to reduce the air flowing into the open charging door during loading.

The scrubber and all of the water piping must be arranged to permit ready draining. This will prevent freezing when the unit is not being used during the winter period.

Stack

Whether the cyclone separator or the scrubber is used, the present Van Packer stack or a stainless steel equivalent should be extended, suitably braced, to the same height as the adjacent brick stack. This is to assure free and unimpeded dispersion of the residual plume.

Estimated Costs

It is estimated that the cost of a suitable commercial cyclone separator will be approximately $2,500. The purchase and installation of such a cyclone, with the above-suggested taller stack and associated connecting ducts, will involve an estimated total cost of about $6,000. Two known fabricators of suitable cyclone separators are:

(a) [redacted] 25X1

(b)

Similarly, it is estimated that to purchase and install an appropriate commercial scrubber suitably connected and controlled, and with a taller stack, will cost about $12,000.

It is emphasized that these costs do represent "ball park" estimates, and will have to be checked against the totals of estimates obtained from equipment manufacturers and installers.

4. It is the recommendation of TSD to employ the cyclone separator system. However, whatever the solution, the exhaust stack from the incinerator should go straight through the roof before turning toward the stack. Also, the portion of the pipe within the building should be surrounded by a well-ventilated radiation shield.

5. If the recommendations of TSD are followed it is felt that the burning of the incinerator at Quarters Eye will be no more objectionable than the incinerators at several of the other government buildings. To assure that proper procedures are followed, we will be willing to purchase the appropriate cyclone separator and to have one of our consultants stand by during installation costs.

6. If we can be of any further service please call either [redacted] 25X1
[redacted] of the Engineering Branch on [redacted] 25X1

25X1

SIDNEY GOTTLIEB
AC/TSD/R&D

cc: OL/RB&C 25X1
OS/PSD

DD/P/TSD/EB

3 Jan 62 - TSD-913-27-1475-62 submitted for [redacted] Cyclone collector $2,735.00 25X1

26 Apr 62 - [redacted] RD 154 To 9 WO 8 25X1
$2,650 Tech. Serv. on Mod I incinerator
at [redacted] 25X1

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